IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Invention: HYDROFOIL SYSTEM FOR LIFTING A BOAT PARTIALLY OUT OF WATER AN AMOUNT SUFFICENT TO REDUCE DRAG

Examiner: Agent's Doc. No.: TOSR18A

As article No.: EL586862321US EXPRESS MAIL I hereby certify, that on the below indicated date, this correspondence is being deposited with the United States Postal Service with sufficient postage in an envelope addressed to the: Commissioner for Patents, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

MS Patent Application
Commissioner for Patents
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ALEXANDRIA, VA 22313-1450

BY: _____
Agent for Applicant

Date: March 08, 2004

PETITION TO MAKE SPECIAL UNDER 37 CFR 1.102 AND MPEP 708.02(VIII)

Petitioner hereby petitions that the above-identified patent application be made special, accordingly attached herewith is applicant's check number 5303 drawn on SOUND CREDIT UNION, in the amount of $130.00 to cover the required petition fee, as required by MPEP 708.02(VIII)(A), and set forth in 37 CFR 1.17(h).

The above-identified patent application contains claims 1-22 directed to a single invention of a HYDROFOIL SYSTEM FOR LIFTING A BOAT PARTIALLY OUT OF WATER AN AMOUNT SUFFICENT TO REDUCE DRAG, as required by MPEP 708.02(VIII)(B).

A pre-examination search was made by a professional searcher. The field of search, as required by MPEP 708.02(VIII)(C), is accordingly submitted here with and is appropriately indicated in the following table:

CLASS	ASSOCIATED SUBCLASS
114	057, 274, 275, 277, 282, 286
441	064

Except for references which were already submitted with the application and are accordingly marked with an "*" asterisk, one copy of each of the references deemed most closely related to the subject matter encompassed by the claims are submitted herewith, as required by MPEP 708.02(VIII)(D), along with a supplemental INFORMATION DISCLOSURE CITATION Form PTO-1449 listing all of these said references.

A detailed discussion of the references, which discussion points out, with the particularly required by 37 CFR 1.111 (b) and (c), how the claimed subject matter is distinguishable over the references follows, as required by MPEP 708.02(VIII)(E).

The present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 3,092,062 to Savitsky teaches in combination with a water borne vessel, a passive self-compensating hydrofoil control system comprising a substantially vertical hydrofoil strut member and a hydrofoil plane, said vertical strut member being connected at its upper end to the hull of said vessel, said hydrofoil plane being disposed at the lower end of said strut member and operable to maintain a hydrodynamic lift of the vessel to a minimum submergence of the hydrofoil plane below the free water surface at cruise speed of the vessel, each of said strut and plane members having integral pivotal flaps defining at least a portion of the trailing edges of said members, said pivotal flap of the strut member terminating at its lower end at a height above said hydrofoil plane which is greater than said minimum submergence, and mechanical linkage means interconnecting both of said pivotal flaps and operable, on application of unbalanced external forces to one flap causing it to pivot, to apply to the other flap a force acting to move said other flap toward a position for equalizing the forces applied to both flaps.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 3,577,948 to Frey teaches an attachment for a power boat which fits on the transom or stern of the boat and comprises a pair of trim tabs hinged at the transom and extending rearwardly therefrom, and which may be swung vertically simultaneously to different angular positions to trim the boat so that it operates at the proper attitude regardless of its loading. The tabs are so formed that they also bring about lateral stability as well as impart the proper attitude to the boat. Furthermore, the tabs are positively moved vertically up or down to their selected angular positions.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 3,651,775 to Kock teaches the present invention relates to a hydrofoil system attached to a hull of a vessel. The foil are attached to the hull of a vessel by means of non-lifting struts and each foil comprises a main lifting foil portion which consists of submerged middle section and two upwardly and outwardly inclined side section which control the end position of the lift. In a spaced relation and parallel to the inclined sections, two auxiliary

upper lifting foil portions are attached on each side of the hull for supporting the lifting action and stabilizing the vessel.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 4,756,265 to Lane teaches a thrust collar is disclosed for mounting around the upper portion of the propeller of an inboard/outboard engine. Each thrust collar supports a horizontal hydrofoil wing extending laterally from the collar. A second, similar wing can be provided on an opposing side of the collar. Where the collar is used in pairs on paired engines on a catamaran hull, a single hydrofoil wing can be supported between the thrust collars. The thrust collar is preferably used in conjunction with hull lifting structures. One hull mounted hydrofoil structure is supported at the lower end of the strut extending and includes a generally curvilinear gull-wing shaped lower surface. For V-type hulls, a pair of elongated mechanical lifting structures, symmetrically positioned on either side of the keel substantially in the vicinity of the keel are attached to the hull so as to extend generally traversedly to the sloping side surfaces of the hull intersecting at the keel. These lifting structures have a length many

times greater than their maximum transverse dimension and preferably extend from a position approximately a midship beneath the hull to the stern of the hull. Retractable hydrofoil assemblies are described for drawing a strut supporting a hydrofoil wing into a boat or rotating the strut upward into a tunnel beneath the boat in the case of a catamaran hull.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 4,915,048 to Stanford teaches planing vessels of improved performance capability and methods for improving such performance and foils which may be associated with a planing vessels for providing improved performance capability. A dynamic downward force generated as the vessel moves through water, preferably by a foil, is imposed on the vessel, with the locus of the force positioned, in the traverse direction, at the longitudinal vertical centerline plane of the vessel. In the longitudinal direction the locus of the dynamic force is positioned, relative to the other forces acting fore-to-aft on the vessel, to decrease the trim angle of the vessel, desirably to less than two degrees. Vessel wetted surface configurations are provided for

stable and efficient operation at low trim angles, including the following. A deep draft, fine entrance which minimizes rise at the bow experienced with conventional planing vessels and assists in maintaining laminarity of flow at the planing surfaces. A foil extending along the bowpeak below the waterline and spaced forwardly thereof to streamline the flow passing the bow to thereby decrease spray and turbulence. A skeg extending downward at the bottom of the hull at the entrance along the longitudinal centerline plane which improves directional stability and also assists in maintaining flow laminarity. A swept back wing located at the entrance, preferably mounted at the lower margin of the skeg positioned with an angle of attack which generates an upward force to improve the vessel stability against pitch and yaw in disturbed water. An aftmidships planing floor having a rise from midships to the stern trailing edge desirably from 50% to 100% of the midships draft improves the stability of the vessel when operated at trim. A release floor extending aftward 5 to 25% of the waterline length of the vessel, preferably from a transverse step and rising over this length 10 to 50% of the midships draft to a transverse trailing edge. The trailing edge and the release floor, in the transverse direction, are parallel with base plane of the vessel. The pressure release floor reduces the pressure on the aftward flow to separation at the trailing edge in a gradual and uniform manner which reduces drag. The foil to generate a downward force in the flow desirably is positioned below the stern trailing edge and contoured to produce minimum induced drag and to divert the flow at its trailing edge downwardly so as to reduce turbulence and drag at the stern.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear

hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 5,404,830 to Ligozio teaches the invention is a displacement boat hull having the outboard surfaces of its wetted portion designed with a deep-V shape, and having at least one pair of retractable hydrofoil fins positioned in respective pockets along those outboard surfaces at a predetermined distance above the keel. When extended, the fins are positioned at fixed angles relative to the hull, and at least one pair of fins is positioned in proximity to the stern. In a preferred embodiment, a conventional deep-V semi-displacement hull is modified to increase the conventional maximum draft with an unusually steep angle (at least 30 degrees to 40 degrees) for the initial deadrise from the keel upward toward the chine; and at least two pairs of fins are disposed on opposite sides of the hull, with an aft pair being positioned in proximity to the stern and another pair being positioned forward of the stern pair, preferably just forward of the boat's center of balance. The fins are continuously adjustable from (a) a fully-retracted in-pocket position to a fully-extended position laterally outboard of the hull. The invention can be used to modify catamaran and tri-hulls as well as mono-hulls, and it is compatible with all types of propulsion systems. Such modifications provide a remarkably low center of gravity that assures excellent balance and stability at all times, particularly when operating with the fins, while achieving higher speeds and requiring less power.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 6,146,224 to McCarthy teaches methods which are disclosed for increasing lift and decreasing drag on hydrofoils and swim fins. These methods include providing a hydrofoil with a highly swept back leading edge portion and orienting the hydrofoil at a significantly reduced angle of attack in which the reduced angle of attach occurs at an angle that is substantially transverse to the hydrofoil's direction of movement through a surrounding fluid medium. The lee surfaces of the hydrofoil is provided with a substantially unobstructed flow path as well as a separation reducing contour so as to permit lift generating attached flow conditions to form along such lee surfaces. Substantially rigid structural reinforcement is provided to prevent the hydrofoil from deforming significantly during use. Methods are disclosed for providing a hydrofoil with a substantially longitudinal recess or venting system located substantially along the center axis of the hydrofoil. The attacking surfaces of such a hydrofoil is provided with an anhedral contour that forms a substantially lengthwise channel with the recess or venting means located along the center axis of this lengthwise channel.

The anhedral contour directs water toward the center axis of the lengthwise channel, and the central recess or venting system permits water to flow through it toward the ice surfaces in order to reduce the occurrence of outward directed spanwise flow conditions along the attacking surfaces and encourage inward directed spanwise flow conditions to occur along the attacking surfaces. The central recess or venting system also permits the water flowing in an attached manner along the lee surfaces of the hydrofoil to merge with the water flowing from the attacking surfaces through the recess or venting system so that life is efficiently generated. Methods are disclosed for applying these lift generating and drag reducing methods to both non-flexible and flexible hydrofoil blades that are used in reciprocating propulsion strokes through a fluid medium. Methods are disclosed for permitting flexible hydrofoils to deform in a manner which permits such efficient flow conditions to form under significantly light reciprocating strokes while simultaneously providing sufficient structural reinforcement to enable such flow conditions to be maintained without experiencing undesirable forms of deformation. Also provided are methods for significantly controlling and reducing the build up of torsional stress forces within a flexible hydrofoil as it is encouraged to twist to a reduced angle of attack during use so that such a twisted form is created with significant improvements in efficiency, contour, and ease.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly

from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 6,164,235 to Hoppe teaches the invention provides a hydrofoil equipment water craft comprising at least one hull member, terminating at a bow and a stern, a front hydrofoil member arranged in the zone of the bow of the hull, at least partially below the hull; and a rear hydrofoil member positioned to the rear of the longitudinal center of gravity (LCG) of the hull, the front hydrofoil member being at least partially offset transversely relative to the rear hydrofoil member so that the front hydrofoil or rear hydrofoil are at least partially disposed in separate longitudinal flow streams.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

U.S. Patent No. 6,354,237 B1 to Gaynor et al. teaches a trim tab control system is provided in which four buttons or switches are provided for the marine operator in which the operator can select to

raise the bow, raise the stern, raise the port side of the boat, or raise the stern side of the boat in relative terms, and the system will automatically position the trim tabs to most efficiently achieve the operator's demanded change in position of the marine vessel.

In contradistinction, however, the present invention teaches a hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

Pursuant to 37 CFR Sec. 1.111(c), the present invention defines the following advantageous distinctive feature, inter alia that distinguishes over, and avoids, the prior art:

> "A hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive, wherein the boat has a hull with a bottom, a bow, a stern with port and starboard trim tabs, and a substantial center which is intermediate the bow of the hull and the stern of the hull, said system comprising: a front hydrofoil unit; a center hydrofoil unit; and a pair of rear hydrofoil units; wherein

said front hydrofoil unit is for depending from the bottom of the hull at the bow thereof; wherein said pair of rear hydrofoil units are for depending from the port and starboard trim tab units of the hull, respectively; and wherein said center hydrofoil unit is for depending from the bottom of the hull at the substantial center thereof. "

In evaluating the prior art one must bear in mind, inter alia, that the prior art must accomplish applicant's results, which was succulently expressed in the Board of Appeals decision in Ex parte Tanaka, Marushima and Takahashi, 174 USPQ at 38, where the Board held:

> "Claims can not be rejected on the ground that it would be obvious to one of ordinary skill in the art to rewire prior art devices if it does not accomplish applicant's result." [Emphasis added]

And in In re Wright, 122 USPQ 522 (1959), where the Court held:

> "...the mere aggregation of old elements that did not perform a different function is not a patentable invention, but that a novel combination of old elements which cooperate with each other to produce a new or useful result or a substantial increase in efficiency is patentable."[Emphasis added]

And further in the en banc decision in In re Dillon, 919 F.2d 688, 692 (Fed. Cir. 1990), where the Court held:

> "...a prima facie case of obviousness requires that the prior art suggest the claimed compositions' properties and the problem the applicant attempts to solve." [Emphasis added]

Further support for considering the results accomplished by the present invention discussed, supra, in determining patentability can be found in the decision in In re Echerd, 176 USPQ 321 (CCPA 1973), where the Court held:

> "there is nothing inherently wrong in defining something by what it does..."[Emphasis added]

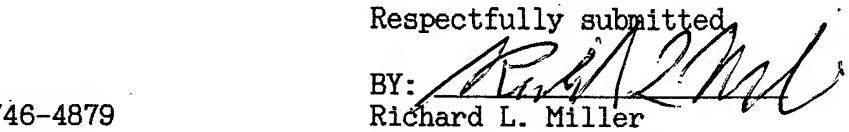
In this same regard, the Examiner's attention is directed to the decisions in In re Halleck, 164 USPQ 647 (CCPA 1970); and Kockum Industries, Inc. v. Salem Equipment, Inc., 175 USPQ 81 (9th Cir. 1972).

Petitioner has provided clear and convincing evidence arguendo that the prior art does not accomplish applicant's result of providing an efficient hydrofoil system for lifting a boat out of water an amount sufficient to reduce drag while still allowing the boat to be powered by a conventional inboard-outboard drive. The hydrofoil system includes a front hydrofoil unit, a center hydrofoil unit, and a pair of rear hydrofoil units. The front hydrofoil unit includes a hydrofoil portion that dependingly mounts to a mounting portion thereof that depends from the bottom of the hull at the bow thereof. The center hydrofoil unit includes a hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from the bottom of the hull at the substantial center thereof. Each rear hydrofoil unit includes a

hydrofoil that dependingly extends equidistantly outwardly from a pair of stanchions thereof that depend from port and starboard trim tab units of the hull, respectively.

It is believed that the above disclosed PETITION TO MAKE SPECIAL is in compliance with all sections of MPEP 708.02(VIII) and it is accordingly respectfully requested that the above-identified application be made special and that it be acted upon before all non-special cases.

Respectfully submitted,

BY: 

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